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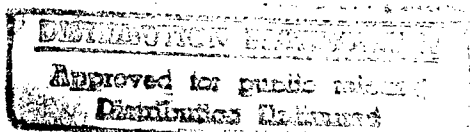
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THE STATUS OF THE FUNCTION OF CERTAIN ENDOCRINE
GLANDS IN RHEUMATISM

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THE STATUS OF THE FUNCTION OF CERTAIN ENDOCRINE
GLANDS IN RHEUMATISM

[This is a translation of an article written by
Docent A. Z. Davletkil'deyeva in Kazanskiy
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From the First Chair of Therapy (Head -- Prof L.
M. Rakhlin), Kazan' State Institute for the Advanced Train-
ing of Physicians imeni V. I. Lenin [GIDUV].

In studying the functional state of the thyroid and the elimination of 17-ketosteroids in rheumatic patients, we observed certain regularities in various forms of this disease. Since the thyroid function and the secretion of glucocorticoids by the suprarenal cortex is connected with the function of the anterior hypophyseal lobe which represents the source of the thyrotropic as well as the adreno-corticotropic hormones, we undertook a parallel, simultaneous investigation of the iodine ¹³¹ absorption by the thyroid and elimination of 17-ketosteroids in the urine.

The studies were carried out on 27 patients. Twenty-three were rheumatic patients; of these, four had an acute rheumatic polyarthritis, eleven a relapsing endomyocarditis and mitral defect with a marked degree of cardiac insufficiency, and eight mitral stenosis with a latent endomyocarditis. Four were suffering from other diseases.

In accordance with the data cited by us in previous studies (1), we obtained changes in the thyroid function as well as in the elimination of 17-ketosteroids in the urine of seven patients suffering from an active form of acute polyarthritis. The elimination of 17-ketosteroids proved to be lower, up to 1.2 -- 6 mg in 24 hours, in three rheumatic polyarthritis patients, and in eight of eleven patients with an exacerbation of recurrent endocarditis. In only one case of polyarthritis and in three cases of an exacerbated endocarditis there was elimination of 11 to 12 mg of 17-ketosteroids (lower limit of norm); in four patients with normal elimination of 17-ketosteroids, i.e., without such changes of the suprarenal cortex which could be reflected in this test, the thyroid function proved to be higher.

(1) Works of the Kazan' GIDUV, Vol 14, Kazan', 1959

This fact expressed itself in higher figures of irradiated iodine absorption, up to a 48 percent level in 24 hours, and a stable content in three patients after 48 hours. In the rest of the patients with more acute rheumatic manifestations, the thyroid function was higher in six and normal in four patients. It was lower in one case only, with iodine 131 absorption limits up to 12 percent within 24 hours.

Of eight patients with latent endocarditis and mitral stenosis, the elimination of 17-ketosteroids was found to be normal in six; in only two patient with marked second and third degree cardiac insufficiency was it lower -- within 1.5 to 3 rng limits. Both patients suffered from a grave mitral affliction with a high degree of stenosis, chronic congested liver, and auricular fibrillation. The thyroid function was noticeably lower, with iodine-131 concentration in the thyroid from 7 to 13 percent within 24 hours.

In four patients without such marked cardiac insufficiency, the thyroid function as well as the 17-ketosteroid elimination was normal; in one it was slightly higher; in another somewhat lower with iodine-131 absorption by the thyroid equal to 13 percent within 24 hours.

Thus, in rheumatic polyarthrits and an exacerbated recurrent endocarditis, contrasting changes in the thyroid function and the elimination of 17-ketosteroids were quite frequently observed, which is in accord with our previous observations.

In latent endocarditis the diminished thyroid function, which appears in advanced cardiac insufficiency, combines with marked decrease of elimination of 17-ketosteroids. The thyroid function and elimination of 17-ketosteroids may remain normal when cardiac insufficiency is absent in patients with mitral stenosis based on latent endocarditis.

We used ACTH in the treatment of rheumatism in its active phase in the tested group of patients who were suffering from its polyarthritic form and a flare-up of endocarditis. The usual methods of cardiac therapy with digitalis were employed in cardiac insufficiency patients with valvular lesions.

As mentioned above, the thyroid function, already higher before treatment, has in none of the patients reverted to normal as the result of treatment. We were able to observe that under the influence of ACTH, parallel with the increase of the elimination of 17-ketosteroids and gradual improvement of the patient's condition, the iodine 131 concentration in the thyroid was even somewhat higher than the initial value. This was particularly clearly

manifested in cases where the elimination of 17-ketosteroids reached the normal level or even higher. In cases of diminished or normal absorption of iodine-131 before treatment, the elimination of 17-ketosteroids after a course of therapy with ACTH was higher. The distinct increase of absorption of iodine-131 by the thyroid following ACTH therapy attests to the enhancement of the function of this gland. We shall cite examples:

1. G., 17 years of age. Acute rheumatic polyarthritis (first attack), mitral endocarditis with a developing stenosis of the left venous foramen. The patient is feverish. Leucocytes -- 10.900; eosinophils, 10 percent, ROE [erythrocyte sedimentation rate -- RES] -- 53 mm/hour; Veltman reaction, 4th test tube (displacement of the coagulation band to the left). Absorption of iodine-131 in the thyroid gland within 24 hours, 23 percent; elimination of 17-ketosteroids for a 24-hour period, 4.5 mg.

After ACTH therapy (540 units): leucocytosis reverted to norm, content of eosinophils reduced to four percent, the coagulation band became normal (7th test tube). The radioactive iodine absorption rose to 36 percent within 24 hours, the 17-ketosteroid elimination constituted 22.5 mg for a 24 hour period. The clinical results of the therapy were good.

2. Kh., 25 years of age. Acute rheumatic polyarthritis (second attack), endocarditis with mitral insufficiency, chronic tonsillitis. Previous to treatment the iodine-131 absorption by the thyroid was 17 percent in 24 hours, elimination of 17-ketosteroids with the urine, 3.5 mg in 24 hours.

After ACTH therapy (475 units) the thyroid function, with a background of clinical improvement, was characterized by iodine-131 absorption equal to 39 percent in 24 hours, and the elimination of 17-ketosteroids at this time increased to 9.4 mg.

These observations show that under the effect of ACTH, with the amelioration of the patient's condition and disappearance of symptoms of an acute rheumatic course, not only does the 17-ketosteroid elimination increase, but also the thyroid function increases (even when it was originally higher).

When the treatment had no effect and the course of the disease was grave, with a continuous cardiac insufficiency, chronic congestion of the liver and reduced absorption of iodine-131 by the thyroid, no increase of the thyroid function or in the rate of elimination of 17-ketosteroids could be detected.

3. Kh., 57 years of age, can serve as an example. Recurrent endomyocarditis with marked stenosis of the left venous foramen, insufficiency of the mitral valve, auricular fibrillation, and chronic cardiac insufficiency 3-A. Thyroid function: iodine-131 absorption -- 15 percent within 24 hours with a slow gradual rise of the curve. Elimination of 17-ketosteroids in the urine, 9 mg.

One and one half months later slight improvement was evident by reduced edema and disappearance of the skipping pulse beats and night attacks of dyspnea; the iodine-131 absorption by the thyroid was seven percent within 24 hours, the 17-ketosteroid elimination went down to 1.5 mg. The patient died a month later with indications of cardiac insufficiency. The diagnosis of endomyocarditis was confirmed by the post mortem examination.

Parallel studies of the thyroid function and adrenal cortex on the elimination of 17-ketosteroids in rheumatism show that under the effect of ACTH there is along with general improvement, an increase of 17-ketosteroid elimination and an augmentation of the thyroid function. The latter effect is particularly manifest where it was low before treatment.

This effect of ACTH therapy on the functional state of the thyroid in rheumatism support the concept of hypophyseal participation (the hypophyseal-intermediary systems) in the internal pathogenesis of rheumatism.

Presumable, the reduction of the adrenocorticotrophic hormone secretion by the hypophysis together with its external elimination is accompanied in these cases by an increased secretion of the thyrotrophic hormone. This problem requires special study, especially in regard to the mechanism of such ACTH effect. It is more likely that this effect is indirect than direct.

At the same time, it is an interesting fact that during the unfavorable course of the process, both the thyroid function and the elimination 17-ketosteroids remain low.

Conclusions

1. Impairment of the thyroid function in rheumatism is observed in the majority of patients.

2. In acute forms of rheumatism there is, as a rule, an accelerated absorption of iodine by the thyroid, an effect more pronounced in acute polyarthrititis (the exudative phase of rheumatism).

3. The function of the adrenal cortex also changes

in various forms of rheumatism. In "exudative" forms accompanying a slow course of the process with circulatory insufficiency, the quantity of 17-ketosteroids in the 24-hour urine is drastically reduced. As the process improves with treatment, an increase in the elimination of 17-ketosteroids in the 24-hour urine is observed.

4. In acute rheumatic polyarthrititis and during a

flare-up of a recurrent endocarditis contrasting changes in the thyroid function and the elimination of 17-ketosteroids are more frequently encountered.

5. Parallel studies of the thyroid and adrenal cortex functions in rheumatism show that ACTH therapy produces along with clinical improvement, an increased elimination of 17-ketosteroids and also an increase of thyroid function, which was low before treatment. During an unfavorable course of the disease the thyroid function and the elimination of 17-ketosteroids remain steadily low.

6. The elimination of 17-ketosteroids increases especially clearly following favorable therapeutic results from the use of ACTH, indicating the good functional reaction of the adrenal cortex to stimulation with the hormone. In cortisone therapy no increase is observed in the elimination of 17-ketosteroids. Following excessive dosage or a negative reaction one can even find a lower rate of elimination of 17-ketosteroids, indicating inhibition of the suprarenal cortex function.

7. Changes in the function of the adrenal cortex and the thyroid in rheumatism, and the effect of ACTH on these functions, confirm the participation of the hypothyseal-intermediate systems in the "internal pathogenesis of rheumatism."

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